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A REVISION OF THE GENUS SCHKUHRIA

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Schkubria is a member of the tribe Helenieae of the family Compositae. The problem of the correct generic name for this group of plants was considered by a Special Committee for Phanerogamae and Pteridophyta appointed by the 6th International Botanical Congress, Amsterdam, 1935. The action of the committee relegates the *Schkubria* Moench (1794) to synonymy under *Siegesbeckia*, rejects *Tetracarpum* Moench (1802), and validates *Schkubria* Roth (1797). The type species is designated as *S. abrotanoides* Roth, Cat. Bot. 1:116. 1797.²

Asa Gray was one of the first to make valuable contributions to the knowledge of the genus in his "Notes on Compositae"³, and his later revision in "Contributions to North American Botany"⁴. The next extensive revision of the genus was P. A. Rydberg's treatment of the North American species for the North American Flora⁵ in which eight species were recognized as belonging to *Tetracarpum*, and a new genus, *Cephalobembix*, was created for *S. multiflora*. The most recent work on the genus is A. L. Cabrera's excellent paper on the Argentine species⁶. All in all, the genus has never been monographed, and since the time of Gray has not been treated in its entirety.

The overlapping of morphological characters makes it difficult to separate several genera in the tribe Helenieae⁷. Nor has it been easy to separate *Schkubria*

¹ In the fall of 1943 Mr. Norlan C. Henderson, a fellow student in the Henry Shaw School of Botany of Washington University, began a study of *Schkubria*, but was unable to complete it because of conditions incident to the war. For his use the representation of this genus in the Missouri Botanical Garden Herbarium had been supplemented through loans from several of the larger American herbaria. The assemblage of this relatively large series of specimens afforded an excellent opportunity for a critical study of the group, and with the approval of Mr. Henderson the work was continued. The results are here recorded in the form of a preliminary revision of the genus.

² Kew Bull. Misc. Inf., p. 129. 1940.

³ Gray in Proc. Am. Acad. 9:198. 1874.

⁴ *Ibid.* 19:27. 1883.

⁵ Rydberg in N. Am. Fl. 34:44. 1914.

⁶ Cabrera in Anal. Soc. Cient. Argent. 114:187. 1932.

⁷ See Gray, *loc. cit.*, and in Proc. Am. Acad. 15:40. 1879.

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from the closely related genus, *Babia*, although Rydberg⁸ places them in different subtribes. The fact that no or only a very few ligules are present in *Schkubria*, whereas they are numerous in *Babia*, is the most reliable though not natural character separating the two genera. When more specimens of *Babia* are available this problem should be examined in greater detail. Although few generic transfers have been made in this paper, future study may warrant them. The "true" *Schkuhrias* are *S. pinnata* (Lam.) O. Kuntze and *S. anthemoidea* (DC.) Coult. and their varieties, while the remaining species of the genus are very closely related to certain species of *Babia*, namely, *B. Bigelovii* Gray, *B. Schaffneri* S. Wats., *B. xylopoda* Greenm., and *B. Pringlei* Greenm.

Within the genus the pappus has always served as the chief diagnostic character, and Gray was one of the earliest to realize that it was "highly probable that the difference in the pappus, although constant in the specimens, is not of specific importance"⁹. However, the pappus, up to the time of Cabrera's¹⁰ work, continued to serve as the main specific character. His realization that the pappus was extremely variable brought about a drastic reduction of the species then recognized in the South American flora. The writer has carried out his principles in the treatment of the North American species. In the present paper a total of six species, six varieties, and two forms are recognized.

Schkubria is entirely American in its distribution with the exception of the few specimens reported from Africa which were probably introduced there. The genus extends in North America from the southwestern United States through Mexico and Guatemala, and in South America from Venezuela and Colombia to Argentina and Chile. Moreover, one species, *S. multiflora*, exhibits a discontinuous distribution between the two continents. It may well be that when more specimens are available for study many of the varieties and forms described herein would better be termed subspecies.

Schkubria pinnata and its varieties, and perhaps *S. anthemoidea* to a lesser extent, have some use in popular medicine¹¹. According to the labels on many of the specimens the plants are used as insect repellents or insecticides, particularly to kill fleas. *Schkubria* deserves further investigation along these lines. An interesting observation made during this study was that the herbarium specimens of *Schkubria* were quite free of insect damage.

The writer wishes to express his thanks to Dr. George T. Moore, Director, for the use of the facilities of the Missouri Botanical Garden; to Dr. Jesse More Greenman, for his helpful criticism and advice; to Miss Nell C. Horner and other members of the staff of the Missouri Botanical Garden, for their cooperation; to Sr. Angel L. Cabrera of the Museo de La Plata, Argentina; and to Mr. Norlan C.

⁸ Rydb., *loc. cit.*, and p. 34.

⁹ Gray in *Smithson. Contr. Knowl.* [Pl. Wright.] 5:95. 1853.

¹⁰ Cabrera, *loc. cit.*

¹¹ O'Donnell and Rodríguez consider *S. pinnata* medicinally in "Las plantas medicinales del noroeste Argentina. II." *Rev. Farm.* (Buenos Aires) 84:149-159. 1942. I have not seen this reference.

Henderson, formerly graduate student, Henry Shaw School of Botany of Washington University. All opinions expressed, however, and any errors are those of the writer. Acknowledgments are made to the herbaria which have loaned specimens for examination. The abbreviations used in this paper are as follows: personal herbarium of A. L. Cabrera (C); Chicago Natural History Museum (formerly Field Museum of Natural History) (FM); Gray Herbarium of Harvard University (G); Missouri Botanical Garden (MBG); Philadelphia Academy of Natural Sciences (PA); University of Texas (T); United States National Herbarium (US).

TAXONOMY

Schkuhria Roth, Cat. Bot. 1:116. 1797; Benth. & Hook. Gen. Pl. 2:403. 1873; Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. 4⁵:260. 1890; Cabrera, Comp. Bonaerenses, in Rev. Mus. La Plata, Secc. Bot. N. S. 4:244. 1941, not *Schkubria* Moench, Meth. 566. 1794.

Tetracarpum Moench, Meth. Suppl. 240. 1802; Rydb. in N. Am. Fl. 34:44. 1914.

Mieria Llave in Llave & Lex. Nov. Veg. Desc. 2:12. 1825.

Achyropappus Link & Otto, Ic. Pl. Rar. pl. 30. 1829, not *Achyropappus* HBK.

Hopkirkia DC. Prodr. 5:660. 1836, not *Hopkirkia* Spreng.

Cephalobembix Rydb. in N. Am. Fl. 34:46. 1914.

Slender, branching, erect or decumbent annuals, rarely perennials. Stems glabrate to hispid. Lowermost leaves opposite, upper alternate, pinnately or bipinnately divided into linear-filiform lobes, rarely simple, often impressed-punctate. Heads discoid or radiate with one to few rays. Involucre obconic to turbinate. Bracts of the involucre 4–18, obovate to oblanceolate, rather narrow, scarious and frequently colored on the margins, occasionally one or more smaller bracts present. Ray-flowers 1–3, rarely more, yellow to white, minute. Disk-flowers few to numerous, yellow, rarely red-tipped, lobes 5, extending about half the length of the throat, glandular tube equal to or less than the length of the throat. Style branches with short acute appendages. Achenes elongate, obpyramidal, generally 4-angled, villous or hispid on the angles, particularly at the base. Pappus of 8, rarely more, scarious squamellae, calloused at the base or with prominent mid-rib becoming an awn in some of the species.

Type species: *Schkubria abrotanoides* Roth = ***Schkuhria pinnata* var. *abrotanoides*** (Roth) Cabrera.

KEY TO THE SPECIES, VARIETIES, AND FORMS OF SCHKUHRIA

- A. Ligules lacking; achenes 10 or more.
 - B. Plants decumbent, annual; leaves inconspicuously punctate; involucreal bracts persistently pubescent.
 - C. At least half of the pappus scales (squamellae) awned.
 - D. Awns of the pappus scales 1 mm. or longer; scales colorless... 3. *S. multiflora*
 - DD. Awns less than 1 mm. long; scales maroon to purplish..... 4. *S. degenerica*
 - CC. Pappus scales not awned (except rarely 1 or 2).
 - D. Involucral bracts 5–6, 2 (rarely 3) mm. broad; achenes generally less than 15; squamellae rarely longer than 0.5 mm..... 3a. *S. multiflora* var. *pusilla*

- DD. Involucral bracts 7 or more, mostly 1–2 mm. broad; achenes generally more than 15; squamellae frequently longer than 0.5 mm. 3. *S. multiflora*
- BB. Plants erect, perennial; leaves conspicuously punctate; involucral bracts glabrate 6. *S. Greenmanii*
- AA. Ligule or ligules usually present; achenes 9 or less (except in *S. schkubrioides*).
- B. Ligules 1 (rarely 2 or lacking), 1–3 mm. long; involucral bracts obovate to lanceolate; squamellae over 0.5 mm. long (except in *S. pinnata* var. *virgata* f. *Pringlei*).
- C. None of the pappus scales awned.
- D. Scales about 2 mm. or longer, equal to subequal.
- E. Achenes short-villous (hairs less than 0.4 mm. long) or hispid on the angles; ligule about 2 mm. long; pappus scales erose; South American plants 1. *S. pinnata*
- EE. Achenes long-villous (hairs more than 0.4 mm. long) on the angles; ligule about 1 mm. long; pappus scales merely denticulate; plants not of South America 2d. *S. anthemoidea* var. *Wrightii*
- DD. Scales about 1 mm. long, unequal, those on the angles longer 1d. *S. pinnata* var. *virgata* f. *Pringlei*
- CC. Half or more of the pappus scales awned.
- D. Disk-flowers 5 or less (rarely 6); achenes long-villous on the angles.
- E. Scales equal to subequal, generally more than half of them awned.
- F. Ligule about 1 mm. long 2. *S. anthemoidea*
- FF. Ligule about 2 mm. long 2a. *S. anthemoidea* var. *guatemalensis*
- EE. Scales unequal, only those on the angles awned (rarely 1 or 2 of the intermediate scales awned).
- F. Ligule about 1 mm. long 2b. *S. anthemoidea* var. *Wislizenii*
- FF. Ligule 2–3 mm. long 2c. *S. anthemoidea* var. *Wislizenii* f. *flava*
- DD. Disk-flowers 5–8; achenes short-villous on the angles.
- E. All, or all but 1, of the scales awned; plants of South America 1a. *S. pinnata* var. *octoaristata*
- EE. About half of the scales awned.
- F. Ligule 2 mm. long; pappus scales slightly overlapping; plants of South America 1b. *S. pinnata* var. *abrotanoides*
- FF. Ligule 1 mm. long; pappus scales not overlapping; plants of Mexico and Central America 1c. *S. pinnata* var. *virgata*
- BB. Ligules usually more than 2, 3–5 mm. long; involucral bracts broadly obovate; squamellae about 0.5 mm. long 5. *S. schkubrioides*

1. **Schkuhria pinnata** (Lam.) O. Kuntze, Rev. Gen. Pl. 3:170. 1898, as synonym of *Rothia pinnata*; Cabrera in Anal. Soc. Cient. Argent. 114:187. 1932.

Pectis pinnata Lamarck in Jour. Hist. Nat. 2:150. pl. 31. 1792.

S. bonariensis Hook. & Arn. in Hook. Jour. Bot. 3:321. 1841, in part.

S. isopappa Benth. Plant. Hartweg. p. 205. 1845.

Amblyopappus mendocinus Philippi in Anal. Univ. Chile 36:184. 1870.

S. coquimbana Philippi in Anal. Univ. Chile 90:29. 1895.

Rothia pinnata α *pallida* O. Kuntze, loc. cit., p. 170, in part.

R. pinnata β *purpurascens* O. Kuntze, loc. cit., in part.

S. abrotanoides var. *pomasquiensis* Hieron. in Engl. Bot. Jahrb. 29:53. 1900, in part.

S. advena Thellung in Fedde, Rep. Sp. Nov. 11:308. 1912.

Erect annual; stems glabrate, striate, 20–50 cm. in height; leaves glabrate, pinnately or bipinnately dissected, or the upper and lower entire, linear, 10–40 mm. long, with the filiform segments 0.5–2 mm. wide, glandular-punctate; heads radiate, numerous, on peduncles 1–5 cm. long; involucre 4–5 mm. high, less wide; involucre bracts 4–5, obovate to oblanceolate, obtuse, punctate, with membranous margins, frequently colored purple, red, or yellow; disk-flowers 5–8, yellow, with tubular corollas; ligules 1, frequently glandular, pistillate, about 2 mm. long; achenes narrow, 3–4 mm. long, about three times as long as broad, hispid to short-villous on the angles, the hairs seldom longer than 0.3 mm.; pappus of 8 muticous scales, mostly unequal, irregular, erose.

Distribution: from Ecuador to Chile and Argentina, 3,000 to 10,000 ft.; elsewhere probably introduced.

ECUADOR—AZUAY: vicinity of Cuenca (from market), *Rose, Pachano & Rose 22829*, in part (G, US). IMBABURA: hills near Ibarra, *Jameson 675* (G, US). PICHINCHA: Andes, Cordillera de Quito, *Jameson 2* (US); "Guapulo prope Quito" (according to Bentham, *loc. cit.*), *Hartweg 1141* (fragment FM, G; photograph FM, G). TUNGURAHUA: vicinity of Ambato, *Pachano 59* (G), *s. n.* (NY, US). PROVINCE NOT DETERMINED: near Pomasqui, *Mille 474* in part (US).

BOLIVIA—COCHABAMBA: Pocona, *Steinbach 8655* (FM, G, MBG); Cereado (?), *Steinbach 9707* in part (FM, MBG); Cochabamba, *Cardenas 740* (US). LA PAZ: vicinity of Sorata, *Bang 1298* (G, MBG, NY, US). TARIJA: Bermejo and Tecumilla, *Fiebrig 2126* in part (G).

PERU—HUANUCO: Huanuco, coll. of 1778–88, *Ruiz & Pavon* in part (NY, US). JUNIN: Mito, *MacBride 3264* (G, US). DEPARTMENT NOT DETERMINED: Uspachaca, *MacBride & Featherstone 1294* (FM, G, US); valley of the Mantaro, *Weberbauer 6469* (US).

BRAZIL—SAO PAULO: Campinas, *Santoro 741* in part (US).

ARGENTINA—BUENOS AIRES: Pergamino, *Parodi 1385* (G). CATAMARCA: Andalgalá, *Jørgensen 1783* (G, MBG, US), *Cabrera 1015* (C). CORDOBA: Córdoba, Aug. 1878, *Hieronymus* (G), *Lossen 56* (G). LA RIOJA: Quachin, *Venturi 7844* (FM, G, MBG, US). JUJUY: Volcán, *Venturi 10192* (MBG), Rio Chico, *3412* (G). MENDOZA: Potrerillos, *Ragonese 250* (C). SANTA FE: Arroyo Seco, *Ragonese 252* (C). SAN JUAN: Quebrada de Zonada, *Rodrigo 2925* (C). SAN LUIS: between Merlo and Rincón, Santa Rosa, Feb. 1929, *Cabrera* (FM, US).

CHILE—COQUIMBO: Rivadavia: Río Turbio, *Cabrera 3502* (C). PROVINCE AND LOCALITY NOT DETERMINED: *Philippi 15425* (photograph, FM).

UNITED STATES. MASS.—NORFOLK CO.: Milton, 25 Sept. 1929, *Kidder*¹² (G, US).

MOZAMBIQUE—Lourenco Marques, *Morensen*¹³ 18 (US).

1a. *Schkuhria pinnata* var. *octoaristata* (DC.) Cabrera in Anal. Soc. Cient. Argent. **114**:190. 1932.

S. octoaristata DC. Prodr. 5:654. 1836.

S. pinnata β *purpurascens* O. Kuntze, Rev. Gen. Pl. 3:170. 1898, in part.

S. abrotanoides var. *isopappa* Hieron. in Engl. Bot. Jahrb. **29**:53. 1900, in part.

Ligule 1–2 mm. long; squamellae of the achenes linear-lanceolate, equal, all or all but one of the scales gradually attenuated into an awn, exceeding the disk-corolla in length; otherwise as in the species.

¹² This plant was found growing in Kidder's garden as a weed. See *Rhodora* **31**:243. 1929. This specimen was determined as *S. Wrightii* but seems to be more closely related to *S. pinnata*.

¹³ This plant seems to be introduced also. It is quite probable that *S. pinnata* var. *abrotanoides* occurs with the typical form here.

Distribution: Ecuador to northern Argentina, 2,000 to 10,000 ft.

ECUADOR—AZUAY: vicinity of Cuenca (from market), *Rose, Pachano & Rose 22829* in part (G, US). CHIMBORAZO: Riobamba, *Schimpff 922* in part (G). PROVINCE NOT DETERMINED: Andes, *Spruce 1789* (FM, G).

BOLIVIA—COCHABAMBA: Cordillera de Tunari, *Eyerdam 24661* (FM, MBG); Cereado (?), *Steinbach 9707* in part (G). LA PAZ: La Paz, *Aspland 4925* (US); vicinity of Sorata, *Mandon 71* (NY). SANTA CRUZ: Buenavista, *Steinbach 6937* (FM, G, MBG, NY, PA).

PERU—APURIMAC: Andahuailas, *Herrera 1492* (G). CUZCO: Cuzco, Feb. 1929, *Herrera* (FM). LIMA: Matucana, *MacBride & Featherstone 275* (FM, G, US).

ARGENTINA—JUJUY: Jujuy, Oct. 1892, *Kuntze* (US). SALTA: Salta, *Holmberg 10635* (MBG). SANTIAGO DEL ESTERO: Estancia el Remate, *Venturi 5836* (US). TUCUMAN: Dept. Burruyaca, *Venturi 2595* (US); Dept. Crianças, *Capia, Venturi 1082* (FM, MBG).

1b. *Schkuhria pinnata* var. *abrotanoides* (Roth) Cabrera in Anal. Soc. Cient. Argent. **114**:189. 1932.

S. abrotanoides Roth, Cat. Bot. **1**:116. 1797; DC. Prodr. **5**:654. 1836.

S. bonariensis Hook. & Arn. in Hook. Jour. Bot. **3**:321. 1841, in part.

Rothia pinnata & *pallida* O. Kuntze, Rev. Gen. Pl. **3**:170. 1898, in part.

S. abrotanoides var. *pomasquiensis* Hieron. in Engl. Bot. Jahrb. **29**:53. 1900, in part.

S. abrotanoides var. *isopappa* Hieron. loc. cit., in part.

Ligule about 2 mm. long; the squamellae on the angles awned, ovate-lanceolate, almost equalling the length of the disk-corolla; the intermediate scales shorter, unequal to subequal, muticous, slightly overlapping the scales on the angles, all of the squamellae strongly calloused at the base; otherwise as in the species.

Distribution: Venezuela and Colombia to Uruguay and Argentina, 750 to 12,000 ft.

VENEZUELA—PROVINCE NOT DETERMINED: San Rafael de Muchchies, *Pittier 13346* (NY, PA, US).

COLOMBIA—CUNDINAMARCA: Soacha near Bogotá, *Bros. Apollinaire & Arthur 109* (G, US). DEPARTMENT NOT DETERMINED: coll. of 1918, *Bro. Joseph* (US, NY), and 9 Aug. 1919, *Guatanita* (US).

ECUADOR—CHIMBORAZO: Riobamba, *Mille 474* in part (G); western Riobamba, *Schimpff 922* in part (MBG). PROVINCE NOT DETERMINED: Coquimba and Guayaquil, *Nee, s. n.* (FM).

BOLIVIA—CHUQUISACA: near Sucre, June 1943, *Hein*¹⁴ (US). COCHABAMBA: vicinity Cochabamba, *Bang 755* (G, MBG, NY, US), *Buchtien 4803* (US). LA PAZ: Chimasi near Chulumani, *Buchtien 2442* (US), Millahuaya, *4802* (US). TARIJA: Bermejo and Tucumilla, *Fiebrig 2126* in part (G, US). DEPARTMENT NOT DETERMINED: Contana, *Buchtien 177* (FM, G, MBG, US); no locality given, *Bridges s. n.* (G).

PERU—AYACUCHO: Hunata, *Killip & Smith 23335* (NY, US); Prov. Cangallo, Hacienda Pajonal, *Stork & Horton 10793* (FM). CUZCO: Prov. Calca, Hacienda Urco, *Vargas 696* (FM). HUANUCO: Huanuco, coll. of 1778-79 in part, *Ruiz & Pavon* (FM, NY). LOCALITY NOT DETERMINED: *Klatt 654* (G), *Weberbauer 6449* (FM).

BRAZIL—SAO PAULO: Campinas, *Santoro 741* in part (US).

URUGUAY—No locality given, March 1876, *Loreato* (NY).

ARGENTINA—BUENOS AIRES: Pergamino, *Parodi 9581* (G, MBG). LA PLATA: Estacion Cargas, *Cabrera 7467* (C). CHACO: Villa Angela, *Boffa 1024* (C). CÓRDOBA: Río

¹⁴ Note from Hein's herbarium label: "Piquipichana or flea-broom. The uses of this plant are to destroy fleas and to fight all sorts of disease, including malaria. It is taken as an infusion, stems and seed being poured in hot water; this same liquid serves to wet the floor of rooms that are to be disinfected."

Tercero, *Burkhardt 10941* (G, MBG); south of Córdoba, coll. of 1878, *Hieronymus* (G); Córdoba, July 1891, *Kuntze* (NY, US), *Lossen 56* (FM, PA). SALTA: Dept. Rosario and Lerma, Campo Zuipano, *Venturi 8044* (US); Dept. Candelaria, Cerro de Chroville(?), *Venturi 3762* (G, US). SANTA FE: entre Rosacio y Casilda, *Ragonese 302* (C). SAN LUIS: Alto Pencoso, Feb. 1914, *Bruch & Carette* (C, G, US). MENDOZA: Santa Rosa, coll. of 1904-5, *Jensen* (US). TUCUMAN: Leales, *Venturi 7141* (714?) (US).

FRANCE—cultivated in Paris, coll. of 1815, *Gay* (G).

The synonymy of the foregoing species and its two South American varieties is exceedingly involved. The writer has examined type material or photographs of types of many of these entities and finds it best to cite them at this time "in part" under more than one heading.

1c. *Schkuhria pinnata* var. *virgata* (Llave) Heiser, n. comb.

Mieria virgata Llave in Llave & Lex. Nov. Veg. Descr. 2:12. 1825.

S. virgata DC. Prodr. 5:654. 1836.

Tetracarpum virgatum Rydb. in N. Am. Fl. 34:45. 1914.

Schkuburia glabrescens Gandoger in Bull. Soc. Bot. Fr. 65:46. 1918.

Ligule about 1 mm. long; the squamellae of the pappus awned on the angles, lanceolate, shorter than the disk-corolla, the intermediate scales generally less than half as long, muticous, equal to subequal, not overlapping the other scales, only weakly calloused at the base; otherwise as in the species.

Distribution: northern Mexico to Guatemala, 5,000 to 9,000 ft.

MEXICO—AGUASCALIENTES: Rincón de Romos, *Shreve 9247* (G). CHIHUAHUA: Río Mayo, *Gentry 1926* (FM, G, MBG, US); near Guerrero, *Pringle 1292* in part (PA), Sierra Madre, Arroyo Ancho, *7082* (G, US). DURANGO: City of Durango and vicinity, *Palmer 509* (G, MBG, NY, US). FEDERAL DISTRICT: near Mexico, *Berlandier s. n.* (G, MBG); Mexico City, *Orcutt 4072* (FM, G, MBG); Lomas de Santa Fé, *Lyonnet 408* (MBG, NY, US); Tlalpam, *MacDaniels 46* (FM); Cerro de Guadalupe, *Pringle 8724* (G, MBG, NY, PA, US), vicinity of Mexico, *7928* (G, MBG, US). GUANAJUATO: Obregon, *Seler 1133* (G, NY, US). HIDALGO: hills above Pachuca, *Pringle 6943* (G, MBG, NY, PA, US); between Pachuca and Real del Monte, *Rose & Painter 6715* (NY, US); Real del Monte, *Ehrenberg 375a* (G). MEXICO: Valle de Mexico, *Bourgeau 372* (G, US); hills above Toluca, *Pringle 9096* (MBG, US); Temascaltepec, Mina de Agua, *Hinton 1405* (MBG, US), Pantoja, *6228* (G, NY). MICHOACAN: vicinity of Morelia, *Kenoyer A127* (FM). PUEBLA: vicinity of Puebla, *Arsène 352* (US), *2315* (MBG, NY, US), s. of Puebla, n. of Hacienda Batán, *1462* (US), Laguna de San Baetasar, 1 Aug. 1909 (US), and Cerro San Juan, 15 Aug. 1906 (US); Cerro del Corral de Piedra, near Oaxaca, *Purpus 3836* (FM, MBG, NY, US). SAN LUIS POTOSI: region of San Luis Potosi, *Parry & Palmer 427* in part (MBG, NY, PA, US); San Luis Potosi, *Schaffner 332* (750) (NY, US). ZACATECAS: near Plateado (Plateros?), *Rose 2748* (US). LOCALITY NOT DETERMINED: *Coulter 314* (G, NY, PA), *Muller 1163* (NY), *Berlandier 708* (fragment FM), *Bonpland s. n.* (FM).

GUATEMALA—HUEHUETENANGO: Chacula, *Seler 2870* (G, US).

Schkubria virgata DC. is best interpreted as a Central American variety of *S. pinnata*, for the only reliable difference lies in the nature of the pappus.

1d. *Schkuhria pinnata* var. *virgata* f. *Pringlei* (S. Wats.) Heiser, n. comb.

S. Pringlei S. Wats. in Proc. Am. Acad. 23:278. 1888.

Tetracarpum Pringlei Rydb. in N. Am. Fl. 34:44. 1914.

As the variety but the squamellae very short, less than 1 mm. long, those on the angles frequently somewhat awned, the intermediate scales still smaller, muticous.

Distribution: Chihuahua and Durango, Mexico.

MEXICO—DURANGO: along road from Durango to Santa Cruz, *Langman 2956* (PA). CHIHUAHUA: Majalca, *Le Sueur 1228* (FM), Cima (FM, T); southwestern Chihuahua, *Palmer 387* (NY, PA, US); base of Sierra Madre, *Pringle 1639* (MBG, NY), near Guerrero, *1292* in part (G, US).

It is worthy of note that in South America certain specimens of *S. pinnata* and its variety *abrotanoides* occur which have a pappus almost identical with that of the above form. I have not separated these specimens (*Venturi 8044* in part, *Steinbach 8655* in part) from the variety, but it is interesting to observe their parallel development. *S. anthemoidea* var. *Wrightii* in Texas also occurs with a very reduced pappus which resembles this form somewhat. I choose to regard *S. Pringlei* S. Wats. simply as a form of *S. pinnata* var. *virgata*, for the only constant difference is found in the size of the squamellae.

2. *Schkuhria anthemoidea* (DC.) Coult. in Donn.-Smith, Enum. Pl. Guat. 4:93. 1895, in part, as "*anthemoides*" sphalm.

Hopkirkia anthemoidea DC. Prodr. 5:660. 1836.

S. Hopkirkia Gray in Smithson. Contr. Knowl. [Pl. Wright] 5:94. 1853.

Tetracarpum anthemoideum Rydb. in N. Am. Fl. 34:45. 1914.

Erect annual; stems glabrate, striate, 20–50 cm. in height; leaves glabrate, pinnately or bipinnately dissected into linear filiform segments, 10–40 mm. long, 0.5–2 mm. wide, or the upper and lower entire, conspicuously glandular-punctate; heads radiate, numerous, on peduncles 1–5 cm. long; involucre 5–7 mm. high, less wide; involucre bracts 4–5, obovate, obtuse, glabrous, punctate, green with scarious colored margins, deep purple to red; disk-corollas rarely more than 5, yellow, rarely red-lobed; ligule 1, pistillate, about 1 mm. long; achenes 3–4 mm. long, about twice as long as broad, thick, striate, densely villous on the 4 angles, the hairs 0.4 mm. or longer; squamellae equal to subequal, ovate-lanceolate to lanceolate, most or all of the scales awn-tipped, about the length of the disk-corolla or only slightly exceeding it.

Distribution: Arizona to southern Mexico, 2,000 to 8,000 ft.

UNITED STATES—ARIZONA: COCHISE CO.: Chiricahua Mts., top of main ridge between Rock and Turkey creeks, *Blumer 1635* in part (G, NY); n. of Fort Huachuca, *Lemmon 4774* (G); Huachuca Mts., *Lemmon 2779* (US); Sunnyside, *Kearney & Peebles 13834* (US).

MEXICO—CHIAPAS: between Tuxtla and San Cristobal, *Nelson 3122* (US). CHIHUAHUA: Río Mayo, Cerro Quicorichi, *Gentry 1924* (FM, G, MBG, US); near Chihuahua, *Pringle 772* (G, MBG, NY, PA, US), hills around Parral, *13566* (G, US). COLIMA: Alzada, *Orcutt 4625* (FM, MBG). FEDERAL DISTRICT: Olivar, *Orcutt 3683* (FM); pyramid of Cuicuilco, Tlalpam, *McDaniels 719* (FM); Tlalpam, *Seler 4111* (G, US); hills north of Mexico City, *Pringle 6781* (G, MBG, NY, PA, US), Cerro de Guadalupe, *9957* (NY). GUANAJUATO: valley of Silao, 24 kilo. s. of Guanajuato, Nov.-Dec. 1893, *Duges* (G). GUERRERO: Tasco, *Abbott 447* (G). JALISCO: Lake Chapala, *Lemmon 76* (G); Tequila, *Palmer 365* (G, MBG, NY, PA, US); hills above Etzatlan, *Pringle*

11568 (G, US). MEXICO: Molino, *McDaniels* 587 (FM), *Rose & Painter* 6979 (FM, MBG, NY, US); near Cuernavaca, *McDaniels* 333 (FM), *Rose & Hough* 4445 (US). NAYARIT: Cerro de la Cruz, e. of Tepic, *Ynes Mexia* 657 (G, FM, MBG, NY, US). OAXACA: coll. of 1922, *Reko*¹⁵ (US). PUEBLA: vicinity of Puebla, Cerro Guadalupe, *Arsène* 1869 (MBG, US), Fort Guadalupe, 86 (US), Cerro and Fort Guadalupe, 1198 (US). SONORA: Cañon de Aribabi, south of Aribabi, *White* 2747A (G). VERA CRUZ: Orizaba, *Miller* 270 (US); Corral de Piedras, *Purpus* 8241 (G, MBG, NY, US). STATE NOT DETERMINED: *Haenke* (photograph of TYPE, FM).

2a. *Schkuhria anthemoidea* var. *guatemalensis* (Rydb.) Heiser, n. comb.

S. virgata Hemsl. Biol. Centr.-Am. Bot. 2:212. 1881, in part.

S. anthemoidea Coult. in Donn.-Smith, Enum. Pl. Guat. 4:93. 1895, in part.

Tetracarpum guatemalense Rydb. in N. Am. Fl. 34:45. 1914.

S. guatemalensis Standl. & Steyermark in Field Mus. Publ. Bot. 22:319. 1940.

Involucral bracts generally reddish or purplish at the apex; ligule about 2 mm. long; disk-flowers 4–6; squamellae subequal, mostly ovate-lanceolate, 4–7 of the scales awned, equalling or slightly shorter than the disk-corolla, always strongly calloused at the base; otherwise as in the species.

Distribution: Guatemala and El Salvador, 1,500 to 8,000 ft.

GUATEMALA—AMATITLAN: Canchalagua, Laguna, *Ruano* 1294 (FM); Canchalagua, *Morales* 792 (US). CHIQUIMULA: llanos around Ipala, *Steyermark* 30316 (FM, NY). GUATEMALA: Estancia Grande, *Standley* 59186 (FM, NY); Finca Bretana, road between Guatemala and Fiscal, *Standley* 59757 (FM). HUEHUETENAGO: Aguacatan road, 10 km. e. of Huehuetenango, *Standley* 82115 (FM); no locality given, *Skutch* 1589 (G). JALAPA: Laguna de Ayarza, *Heyde & Lux* 3802 (FM, G, MBG, NY, US); between Jalapa and base of Volcán Jumay, *Steyermark* 32259 (FM). JUTIAPA: n. of Jutiapa, *Standley* 60512 (FM). DEPARTMENT NOT DETERMINED: "La Aurora," *Ruano* 568 (US); no locality given, *Tonduz* 885 (G, NY, US).

EL SALVADOR—AHUACHAPAN: *Padilla* 235 (MBG, NY, US). SANTA ANA: near Chalchuapa, *Calderón* 962 (FM, MBG, NY, US). DEPARTMENT NOT DETERMINED: *Renson* 305 (FM, G, NY, US); La Cebadilla, *Calderón* 1236 (G, US).

I can regard this plant only as a variety of *S. anthemoidea*, from which it can be distinguished only with difficulty if the locality of the collection were unknown.

2b. *Schkuhria anthemoidea* var. *Wislizeni* (Gray) Heiser, n. comb.

S. Wislizeni Gray in Mem. Am. Acad. II. 4:96. 1849.

Tetracarpum Wislizeni Rydb. in N. Am. Fl. 34:45. 1914.

Involucral bracts yellow to purple at the apex; ligule seldom over 1 mm. long, almost as wide; squamellae lanceolate to ovate-lanceolate, those on the angles awn-tipped, the intermediate ones shorter, muticous.

Distribution: Arizona to central Mexico, 5,000 to 8,000 ft.

UNITED STATES. ARIZONA—COCHISE CO.: Chiricahua Mts., top of main ridge between Rock and Turkey creeks, *Blumer* 1634 (FM, G, MBG, NY, US); Mule Mts., *Harrison & Kearney* 6224 (G, US).

MEXICO—CHIHUAHUA: Mojarachic, *Knobloch* 5464 (FM), southwestern Chihuahua, *Palmer* 387 (G); hills about Parral, *Pringle* 13567 (G, US); Cosihuinachic Mts., *Wis-*

¹⁵ Note from herbarium label: "Brooms of plants sold in markets, used for exterminating fleas."

lizenus 195 (TYPE COLLECTION G, MBG). FEDERAL DISTRICT: Cerro de Guadalupe, *Pringle* 9957 (G, MBG, US). HIDALGO: Pachuca, *Orcutt* 3921 (FM, G, MBG).

2c. *Schkuhria anthemoidea* var. *Wislizenii* f. *flava* (Rydb.) Heiser, n. comb.

Tetracarpum flavum Rydb. in N. Am. Fl. 34:46. 1914.

As the variety but the ligule 2–3 mm. long, less broad.

Distribution: southern Mexico. (I have examined this form only from Oaxaca at altitudes from 5,000 to 7,500 ft.)

MEXICO—OAXACA: District of Etna, Las Sedas, *Conzatti* 5004 (MBG); Oaxaca, *Galeotti* 2049 (2045?) (G); Reyes, *Nelson* 1710 (US); limestone hills near Etna, *Pringle* 4881 (G, MBG, NY, PA, US); Sierra de San Felipe, *Smith* 263 & 626 (TYPE COLLECTION MBG, US).

This species of Rydberg's is no more than a form differing from the variety only in the length of the ligule.

2d. *Schkuhria anthemoidea* var. *Wrightii* (Gray) Heiser, n. comb.

S. Wrightii Gray in Smithson. Contr. Knowl. [Pl. Wright.] 5:95. 1853.

Tetracarpum Wrightii Rydb. in N. Am. Fl. 34:44. 1914.

Ligule about 1 mm. long; disk-flowers 5 or less; squamellae obovate, subequal, rounded at the apex, denticulate; otherwise as in the species.

Distribution: southwestern United States and northwestern Mexico, 3,500 to 7,500 ft.

UNITED STATES. ARIZONA—COCHISE CO.: Chiricahua Mts., top of main ridge between Rock and Turkey creeks, *Blumer* 1635 in part (MBG, NY, US); Silver Creek, Chiricahua National Park, *Eggleston* 10935 (G, US); Mule Mts., *Harrison* & *Kearney* 6088 (G); Ramsey Canyon, Huachuca Mts., *Jones* 25041 (G), and 29 Sept. 1929 (MBG); Apache Pass, Chiricahua Mts., Sept. 1881, *Lemmon* (MBG); plain near Ft. Huachuca, *Peebles*, *Harrison* & *Kearney* 3468 in part (US); base of the Huachuca Mts., 15 Sept. 1884, *Pringle* (G, NY, PA, US); near Fort Huachuca, *Wilcox* 334 (NY, US). PIMA CO.: Greaterville, *Shreve* 4973 (MBG). SANTA CRUZ CO.: Sonoita, *Harrison* & *Kearney* 5703 (US). NEW MEXICO—DONA ANA CO.: Organ Mts., 4 Sept. 1898, *Cockerell* (US), *Wootton* 445 (G, MBG, NY, US), 28 Sept. 1902 (MBG), and 20 Sept. 1908, *Wootton* & *Standley* (US). GRANT CO.: (?) near Santa Rita de Cobre, 21 Sept. 1880, *Greene* (MBG, NY). SIERRA CO.: Fruijilla Creek, *Metcalfe* 1358 (G, MBG, NY, US); Lake Valley, coll. of 1916, *Beals* (US). TEXAS—JEFF DAVIS CO.: Davis Mts. near Mt. Locke, *Hinckley* 478 (FM, NY), Mt. Livermore, 28 Sept. 1935 (FM, T); Davis Mts., *Palmer* 30652a (MBG, PA, T), 19 Sept. 1918, *Young* (T); Limpia Cañon, *Nealley* 189 (FM); 5 mi. n. w. of McDonald Observatory, *Innes* & *Moon* 1133 (G); Ft. Davis, 23 Aug. 1941, *Strandtmann* (T).

MEXICO—CHIHUAHUA: San Diego Cañon, Sierra Madre Mts., 16 Sept. 1903, *Jones* (NY); 30 mi. s. w. of Chihuahua, *Muller* 3341 (G); vicinity of Chihuahua, *Palmer* 346 (US); rocky hills near Chihuahua, *Pringle* 607 (G, MBG, NY, PA, US), 772 in part (PA), hills near Chihuahua, 974 (MBG, NY), mesas near Carretas, 2001 (G, US), dry hills, Parral, 10113 (G, MBG, NY, PA, US); eastern Chihuahua, just east of Orgaños, *Stewart* & *Johnston* 2015 (G); Santa Eulalia, 30 Sept. 1885, *Wilkenson* (US). SONORA: San Pedro, *Hartman* 854 (G); no locality given, *Wright* 1254 (TYPE COLLECTION G, PA).

3. *Schkuhria multiflora* Hook. & Arn. in Hook. Jour. Bot. 3:332. 1841.

Achyropappus schkubrioides Don. ex Hook. & Arn., loc. cit., not *Achyropappus*

schkubrioides Link & Otto.

S. Neo-Mexicana Gray in Mem. Am. Acad. II. 4:96. 1849.

Amblyopappus Neo-Mexicanus Gray in Torr. Pacif. R. R. Rept. 4:106. 1857.

Babia Neo-Mexicana Gray in Proc. Am. Acad. 19:27. 1883.

Babia Gilliesii Gray, *loc. cit.*, p. 28.

S. pusilla var. *aristata* R. E. Fries in Nova Acta Soc. Sci. Upsal. IV. 11:85. t. 6, 8, 1905.

Achyropappus neo-mexicanus Rydb. Fl. Colo. 377. 1906.

Cephalobembix neo-mexicana Rydb. in N. Am. Fl. 34:46. 1914.

S. pusilla var. *longepedicellata* Hauman in Anal. Soc. Cient. Argent. 86:328. 1918.

S. multiflora var. *aristata* Cabrera in Anal. Soc. Cient. Argent. 114:193. 1932, as "*multiflora*" sphalm.

Annual, more or less decumbent, 5–25 cm. in height; stems short-glandular-hairy to glabrate; leaves pinnately dissected into lobes 0.5–1 mm. wide, up to 3 cm. long; petioles 0.2–1 cm. long; peduncles glandular-pubescent, 0.5–3 cm. long; heads discoid; involucre turbinate to obconic, 5–10 mm. wide, 5–6 mm. high; bracts of the involucre 7–9, green, scarious-tipped, frequently red or yellow on the margins, 1–2 mm. wide and narrowing gradually; disk-corollas 15–30, yellow, occasionally red-tipped; achenes black with a few scattered hairs on the faces, white-villous on the 4 angles, 3–4 mm. long; squamellae 1–2 mm. long, obtuse to acutish, rarely several or all of the squamellae awned, usually strongly calloused at the base.

Distribution: southwestern United States into northern Mexico in North America and Bolivia to Argentina and Chile in South America, 5,000 to 11,000 ft.

UNITED STATES. ARIZONA—NAVAJO CO.: between Kayenta and Betatakin, *Eastwood & Howell 6574* (FM). YAVAPAI CO.: Prescott, *Griffiths 7349* (MBG). COLORADO—HUERFANO CO.: Huerfano, *Parry 124, 125* (MBG). RIO GRANDE CO.: banks of the Rio Grande near Del Norte, *Brandege 1228* (MBG), 12 mi. below Del Norte on the banks of the Rio Grande, *4248* (MBG). NEW MEXICO—LINCOLN CO.: White Mts., *Wootton 297* (MBG). SAN MIGUEL CO.: near Pecos, *Standley 5052* (MBG). SANTA FE CO.: Santa Fe, *Fendler 416* (MBG), *Mulford 1366* (MBG); southeast of Santa Fe, 9 Sept. 1881, *Engelmann* (MBG); no locality given, *Brandege 12070* (MBG). SOCORRO CO.: Mogollon Mts., on or near west fork of Gila R., *Metcalf 580* (MBG). VALENCIA CO.: Cubero, *Rusby 706* (PA). TEXAS—BREWSTER CO.: Chisos Mts., *Mueller 8232* (FM, G, MBG, NY, T, US).

MEXICO—CHIHUAHUA: Potrero Mts., *Pringle 773* (MBG); Majalca, *LeSueur 1229* (FM, MBG); near Colonia Garcia in the Sierra Madre, *Townsend & Barber 286* (MBG).

BOLIVIA—LA PAZ: La Paz, *Buchtien 4802, 9227* (G, MBG).

PERU—AREQUIPA: Arequipa, *Pennell 13051, 13162* (FM, G, US). MOQUEGUA: Torata, *Weberbauer 7408* (US).

ARGENTINA—MENDOZA: Potrerillos, *Ragonese 248* (C). TUCUMAN: Valle de Tafi, coll. of 1908, *Bruch* (C, US).

CHILE—ATACAMA: Dept. Vallenar, Rio de la Laguna Grande, above the mouth of Rio Lag. Chica, *Johnston 5889* (G, US). PROVINCE NOT DETERMINED: (Chilecito?), *Gillies s. n.* in part (G).

Notwithstanding the discontinuous distribution of *S. multiflora* and *S. neo-mexicana* the two appear to be the same species. This species appears to be very closely related to certain species of *Babia* but lacks the rays typical of that genus. For this type of distribution see I. M. Johnston, Jour. Arn. Arb. 21:336. 1940.

The problem of the relationship between the aristate and the non-aristate specimens of this species can only be more clearly determined when more speci-

mens are available for study. *Buchtien* 4802, 9227 in part, *Weberbauer* 7408 in part, and *Gillies* s. n. in part, have the pappus provided with four or more awns. In a letter to the author Cabrera writes: "The forms with aristas may be possibly included under the name *S. multiflora* var. *typica* as the original diagnosis gives four mutic and four aristate paleae." Owing to the apparently continuous variation it is probably best at present to include the aristate forms with the species. It is worthy of note to point out that so far no North American specimens of *S. multiflora* have been found with aristate squamellae.

3a. *Schkuhria multiflora* var. *pusilla* (Wedd.) Cabrera in Anal. Soc. Cient. Argent. 114:192. 1932.

S. pusilla Wedd. Chloris Andina, p. 17, t. 14, B. 1855.

Rothia pusilla O. Kuntze, Rev. Gen. Pl. 3:170. 1898.

S. pusilla var. *longepedicellata* Hauman in Anal. Soc. Cient. Argent. 86:328. 1918, in part.

Annual, 1–10 cm. in height; petioles rarely longer than 5 mm.; peduncles 0.2–0.5 cm. long; involucre about 5 mm. high and rarely wider; involucre bracts 5–6, 1–3 mm. wide, olive-green, frequently with yellow (rarely purple) scarious edges; disk-corollas 10–20; achenes about 3 mm. long; squamellae mostly obtuse, 0.5–1 mm. long; otherwise as in the species.

Distribution: Bolivia to Argentina, 8,000 to 12,000 ft. The variety appears to grow at slightly higher altitudes than the species, perhaps accounting in part for its smaller size.

BOLIVIA—LA PAZ: La Paz, *Buchtien* 3069 (US), Cerro de Calvoirio, 707 (US). POTOSI: no locality given, *Cardenas* 433 (US). PROVINCE AND LOCALITY NOT DETERMINED: *Mandon* 73 (FM, NY).

PERU—PUNO: vicinity of Lake Titicaca, *Shepard* 41 (G, NY, US); Chuquibambilla, *Pennell* 13364 (FM, PA).

ARGENTINA—CATAMARCA: Dept. of Andalgalá, El Candado, *Jørgensen* 1282 (G, MBG, US). SALTA: El Alisal, Cerro del Cajón, *Rodríguez* 1422 (C). TUCUMAN: Dept. of Chicligasta, *Venturi* 3298 (US).

COUNTRY AND LOCALITY NOT DETERMINED: *Weddell* 4415 (FM).

I have not seen the type of *Rothia intermedia* of Kuntze, but it is quite probable that it may fall into synonymy under this variety.

4. *Schkuhria degenerica* (O. Kuntze) R. E. Fries, Arkiv för Bot. 5¹³:22. 1906.

S. pusilla var. *major* Schz. Bip. in Bull. Soc. Bot. Fr. 7:80. 1865; Linnaea 34:529. 1866, *nomen nudum*.

S. oolepsis Schz. Bip. loc. cit., *nomen nudum*.

Rothia degenerica O. Kuntze, Rev. Gen. Pl. 3:169. 1893.

Decumbent annual, 10–40 cm. in height; stem lightly glandular-villous; leaves alternate, pinnately or bipinnately divided into divisions about 1 cm. wide; heads discoid on peduncles 1.0–1.5 cm. long; involucre turbinate, 7–9 mm. long, 1 cm. or less wide; involucre bracts 5–7, green, hispidulous, with a scarious yellow, rarely purplish, apex; achenes 30–40, narrow, weakly 4-angled, more or

less compressed, short-villous on the angles, more densely so at the base, 3–4 mm. long; squamellae 2.0–3.5 mm. long, about 1 mm. wide, slightly exceeding the disk-corolla in length, erose, with a reddish-maroon midrib projected into an awn in about one-half of the squamellae.

Distribution: known only from Bolivia.

BOLIVIA—COCHABAMBA: Cochabamba, *Bang 966* (FM, G, MBG, PA, US). LA PAZ: Prov. Larecaja, San Pedro near Sorata, *Mandon 72* (G, FM).

5. *Schkuhria schkubrioides* (Link & Otto) Thellung in Fedde, Rep. Sp. Nov. **11**:308. 1912.

Achyropappus schkubrioides Link & Otto, Ic. Pl. Rar., p. 59, pl. 30. 1829, not *Achyropappus schkubrioides* Don. ex. Hook. & Arn.

S. senecioides Nees, Del. Sem. Hort. Bot. Bonn. 1831.

Babia schkubrioides Gray in Proc. Am. Acad. **19**:27. 1883.

Tetracarpum schkubrioides Rydb. in N. Am. Fl. **34**:46. 1914.

Erect annual, 40–80 cm. in height; stem striate, grooved, glabrate; leaves pinnately dissected into narrow linear divisions, 3–7 cm. long, punctate; heads radiate on peduncles 2–5 cm. long; involucre bracts 6–8, obovate to ovate, with yellow scarious tips, frequently subtended by 1 or more smaller bracts; ligules 1–4, obovate-cuneate, 3–5 mm. long; disk-corollas 15–20, yellow with glandular tubes; achenes elongate-obpyramidal, about 3–4 mm. long, with a few short hairs on the angles; squamellae obovate, about 0.5 mm. long.

Distribution: central and southern Mexico.

MEXICO—DURANGO: Durango, *Palmer 576* (MBG, NY). MEXICO: vicinity of Mexico, *Pringle 9855* (MBG, NY). MICHOACAN: vicinity of Morelia, *Arsène 5723* in part (G), Loma Santa Maria, *5837* (FM, G, MBG, NY, US), Lieux (?) in Andes, *3127* (MBG, US); vicinity of Lerma, north of La Piedad, *Pringle 3281* (MBG, NY).

This species is a connecting link with *Babia*. The glandular-punctate leaves and bracts and the small number of ligules have led me to retain it in *Schkubria*. The pappus most nearly resembles that of *S. pinnata* var. *virgata* f. *Pringlei*, but on the basis of the appearance and number of achenes *S. schkubrioides* is more closely related to *S. multiflora*.

6. *Schkuhria Greenmanii* Heiser, n. sp.

Herba perennis, 35–65 cm. alta; caulibus glandulari-punctatis; foliis alternis, pinnato-dissectis, raro simplicibus, segmentis linearibus vel filiformibus, obtusis, impresso-punctatis, 2–7 cm. longis; capitulis homogamis, 1 cm. altis, usque ad 0.5 cm. latis; involucri bracteis 4–5, obovatis apice obtusissimis, marginibus scariosis et fimbriatis; ligulis nullis; disci floribus 10–20, corollis 5-dentatis, 2–4 mm. longis; achaeniis ca. 3 mm. longis, sparse hirsutis vel ad angulos adpresso-pubescentibus; pappi paleis plerumque 8, 3 mm. longis, lanceolatis, dentatis, aristulatis, 1-nerviis, nervo-medio prominente.

Erect perennial, 35–65 cm. in height; stems striate, glabrate, glandular-punctate; leaves mostly alternate, pinnately dissected into linear-filiform divisions, conspicuously glandular-dotted, rarely entire; heads discoid on peduncles 2–5 cm. long; involucre about 1 cm. high, less wide, turbinate, bracts of the involucre 4–5,

more or less keeled at the base, obovate, margins scarious and provided with a fringe; disk-flowers 10–20 with yellow corolla and glandular tube; achenes 4-angled, lightly hirsute on the angles, more so at the base, about 3 mm. long; squamellae usually 8 (7–10), lanceolate, erose on the margins, provided with a conspicuous midrib extending into an awn, 3 mm. long, almost equalling the length of disk-corolla.

MEXICO—MEXICO: District of Temascaltepec, Luvianos, *Hinton 4507* (MBG TYPE; co-types at G, NY, US).

This plant is the only perennial *Schkubria* known, and on the basis of the pappus seems most closely related to *S. anthemoidea*, under which name it was originally determined. It also has certain affinities with *Bahia*, from which it is distinct by the lack of ray-flowers.

EXCLUDED NAMES AND SPECIES

- Schkubria anthemoides* Wedd. ex Hook. & Jacks. Ind. Kew. 4:827. 1895, as synonym = **Achyropappus anthemoides** HBK. Nov. Gen. & Sp. 4:259. 1820, not *S. anthemoides* of Coult.
- S. Bigelovii* Gray in Proc. Am. Acad. 9:199. 1874. = **Bahia Bigelovii** Gray in Torr. Bot. Mex. Bound. p. 96. 1859. This species is probably best retained in *Bahia* for the present. It is closely related to *S. multiflora*.
- S. biternata* Gray in Proc. Am. Acad. 9:199. 1874. = **Bahia biternata** Gray in Smithson. Contr. Knowl. [Pl. Wright.] 5:95. 1853.
- S. glomerata* Rob. & Seat. in Proc. Am. Acad. 28:109. 1893 = **Florestina pedata** (Cav.) Cass. in Dict. Sci. Nat., Planch. Bot. Dicot. 61:t.86. 1816-29.
- S. integrifolia* Gray in Am. Nat. 8:213. 1874; *Bahia nudicaulis* Gray in Proc. Am. Acad. 19:27. 1883; *Bahia integrifolia* Macbr. in Contr. Gray Herb. 56:39. 1918. = **Platyschkuhria integrifolia** Rydb. in Bull. Torr. Bot. Club 33:155. 1906.
- S. pedata* Gray in Proc. Am. Acad. 9:199. 1874. = **Bahia pedata** Gray in Smithson. Contr. Knowl. [Pl. Wright.] 3:123. 1852.
- S. platyphylla* Rob. & Greenm. in Am. Jour. Sci. 50:156. 1895. = **Florestina platyphylla** Rob. & Greenm. in Proc. Am. Acad. 32:49. 1896.
- Schkubria Schiedei* Gandoger in Bull. Soc. Bot. Fr. 65:46. 1918. I have not seen a specimen of this plant, but from Gandoger's very scanty description it may not even be a *Schkubria*. I can not recognize this species.
- S. viscosissima* Standl. & Steyerl. in Field Mus. Publ. Bot. 22:318. 1940 = **Florestina viscosissima** (Standl. & Steyerl.) Heiser, n. comb. The affinities of this plant are with *F. pedata* (Cav.) Cass., and the nature of the style clearly places it in the genus *Florestina*.
- S. Woodhousei* Gray in Proc. Am. Acad. 19:199. 1874; *Picradeniopsis Woodhousei* Rydb. in Bull. Torr. Bot. Club 37:333. 1910. = **Bahia Woodhousei** Gray in Proc. Am. Acad. 19:28. 1883.